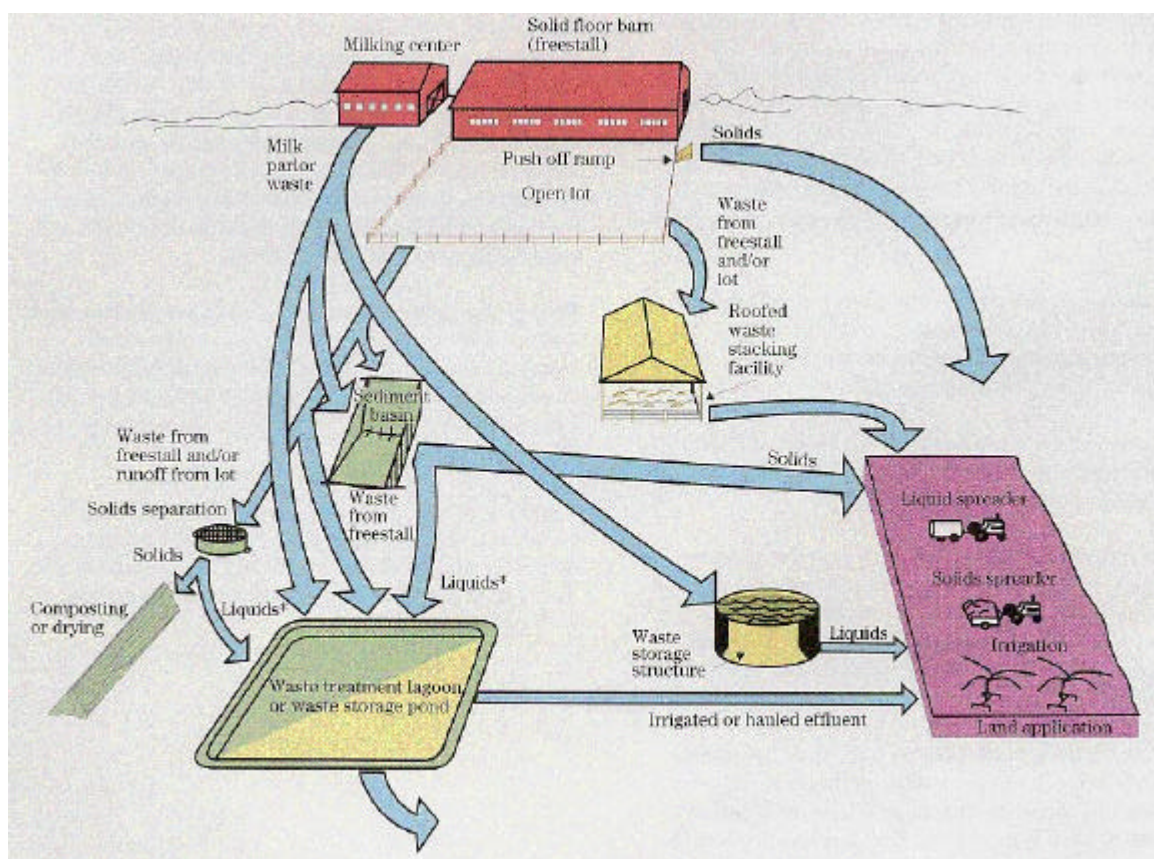


TECHNICAL GUIDANCE FOR DEVELOPING COMPREHENSIVE NUTRIENT MANAGEMENT PLANS



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TECHNICAL GUIDANCE FOR DEVELOPING COMPREHENSIVE NUTRIENT MANAGEMENT PLANS (CNMP'S) IN UTAH

1.0 INTRODUCTION

This document is intended for use by Natural Resources Conservation Service (NRCS), state and local conservation partner field staffs, private consultants, and animal feeding operation owners/operators, and others that will be developing or assisting in the development of [Comprehensive Nutrient Management Plans \(CNMP's\)](#). The purpose of this document is to provide technical guidance for the development of CNMP's as well as a list of essential elements that need to be addressed when developing a CNMP.

The document is not intended as a sole reference for developing CNMP's. Rather, it is to be used as a tool to support the planning process ([Appendix A](#)), as contained in the NRCS National Planning Procedures Handbook (NPPH) ([Appendix B](#)).

2.0 DEFINITIONS

A Comprehensive Nutrient Management Plan (CNMP) is a subset of a conservation plan that is unique to animal feeding operations. A CNMP is a grouping of conservation practices and management activities which, when combined into a system, will ensure that both production and environmental goals are achieved. It incorporates practices to utilize animal manure and organic by-products as a beneficial resource rather than a waste. The term nutrients and organic by-products, as used in this document, include animal manure and urine, milk house and parlor wash water, feedlot or other runoff that has come in contact with manure or is loaded with nutrients, and processing wastes.

A CNMP addresses concerns dealing with nutrient and organic by-products and their potential for adverse impacts on water quality. A CNMP may also address concerns related to soil, air, plants, and animals. A CNMP is developed to assist landowners and operators meet all applicable Federal, State, Tribal and local regulations.

The conservation practices and management activities in a CNMP, for which NRCS maintains technical standards, are to meet these standards. Components of a CNMP for which NRCS does not currently maintain standards are to meet criteria established by Utah State University or other Land Grant Universities, Industry Standards, or other appropriate standards. Ultimately, it is the landowner or operators responsibility as the decision-maker to select the system of conservation practices and management activities that best meet their production and environmental needs from available alternatives.

Where the CNMP is a part of a [Utah Pollutant Discharge Elimination System \(UPDES\)](#) permit, it must undergo a review by an eligible specialist who has been trained to prepare and/or review CNMP's. A list of eligible reviewers can be obtained by contacting the *Utah Division of Water Quality* at (801) 538-6146.

3.0 OBJECTIVE

The objective of a [CNMP](#) is to combine management activities and conservation practices into a system that, when implemented, will minimize the adverse impacts of animal feeding operations on water quality. A CNMP may also address concerns related to soil, air, plants, and animals. CNMP's are to be developed in accordance with procedures contained in the NRCS National Planning Procedures Handbook (NPPH) ([Appendix B](#)) and meet the technical requirements of the NRCS local [Field Office Technical Guide \(FOTG\)](#). For guidance on CNMP plan format and content see [Appendix C](#). In order to meet this objective, a significant increase in current incentive levels and in the intensity and comprehensiveness of technical assistance provided to producers is needed. It is hoped that producer groups, consultants, state agencies, conservation districts, environmental groups and other organizations will step forward to help provide incentives, loan programs, or technical assistance to meet the challenge of developing CNMP's for all animal feeding operations in Utah. The six main elements that should be considered when developing a CNMP are:

1. Manure and Wastewater Production, Collection, Storage, Treatment, and Transfer
2. Evaluation and Treatment of Sites Proposed for Land Application
3. Land Application of Manure and Wastewater
4. Records of CNMP Implementation
5. Feed and Animal Mortality Management
6. Other Utilization Options

4.0 INDIVIDUAL PLAN ELEMENTS

4.1 Animal Outputs - Manure and Wastewater Production, Collection, Storage, Treatment, and Transfer

A manure and wastewater management system for a given animal feeding operation (AFO) should include all system components and management activities that are necessary to minimize degradation of water quality. A system may consist of a single component, such as a clean water diversion or berm, or as many components as necessary to minimize environmental concerns and meet the production and environmental objectives of the landowner or operator.

An on-site visit(s) is required to identify existing and potential natural resource concerns, problems, and opportunities in the siting of manure and wastewater management system components. This includes the identification and documentation of physical features such as buildings, roads, houses, fences, power lines, and other utilities that may effect the implementation of the CNMP. Sufficient data and information must be gathered in order to analyze the treatment and environmental needs in and around the production site and develop appropriate alternatives.

A complete manure and wastewater management system should consider, but not be limited to, activities that address:

- adequate collection, transfer, storage, and/or treatment facilities and equipment that allow application under low risk conditions as well as at times that are compatible with crop management activities
- calculation of the amount of manure and/or wastewater produced
- identification of needed water control devices around the production facility
- appropriate disposal of animal medical wastes
- spills and catastrophic events
- spoiled feed and other contaminants
- milk house wash water
- testing of manure and organic sources
- odor control
- insect control
- silage leachate
- wind abatement
- visual improvement
- identification of operation and maintenance (O&M) practices/activities

Note: The planned manure and wastewater management system needs to be in conformance with the NRCS Waste Management System Practice Standard (Code 312) ([Appendix D](#)). All other planned system components must also be in conformance with the applicable NRCS practice standard.

4.2 Evaluation and Treatment of Sites Proposed for Land Application

This element addresses evaluation and implementation of appropriate conservation practices on sites where manure and wastewater are to be applied. It is essential that runoff, leaching and soil erosion be minimized on these sites. An on-site visit must be made in order to identify and evaluate existing and potential resource concerns and problems. The evaluations are used to identify and assess the treatments (practices) needed to address or solve existing and potential natural resource problems. Assessments should include, but are not limited to:

- individual field assessments using the [Utah Manure Application Risk Index \(UMARI\)](#).
- identification of the potential for nitrogen or phosphorus transport off-site
- identification of sensitive areas such as ditches, canals, streams, lakes, ponds, wells, gullies, springs, and drinking water sources with setbacks, as applicable
- identification of conservation practices and management activities needed for erosion control and water management
- impacts of application equipment on the site (e.g., compaction, erosion, etc.)
- identification of concerns related to pathogens and odors during or after land application of manure or other organic by-products

- soil test analysis for pH, nutrient levels, sodic conditions, and organic matter
- aerial site photographs, soil maps, or other maps
- soil features and limitations
- identification of other features such as property boundaries
- identification of operation and maintenance (O&M) practices/activities

Notes:

1. Records of all site assessments should be kept as a part of the [CNMP](#). The CNMP should address problems or concerns identified during the on-site assessment as well as practices that should be implemented to minimize potential impacts to water quality. (e.g. irrigation system improvement and water management, application setbacks, grazing management, soil testing, manure testing, runoff containment, etc.)
2. Operation and maintenance plans should address all structural and operational components in the CNMP.
3. The planning and assessment process integrates economic, social, and environmental considerations into a system that meets the needs of the natural resources and assists the landowner or operator in meeting Federal, State, Tribal and local requirements.
4. Technical requirements must be in accordance with the NRCS National Planning Procedures Handbook (NPPH) and the FOTG ([Appendix E](#)).

4.3 Land Application

By far, the most common practice in Utah is to apply manure/wastewater to agricultural land. Applications should be based on a balance of the nutrients contained in the manure with the nutrient needs of the crop being grown. This balance is best determined through manure and soil testing. Where these values are not available, the balance may be determined based on book values available through NRCS. Land application should be based on either nitrogen or phosphorus limits. Where the landowner or operator does not have enough land to apply the manure to, they must obtain the right to apply any excess manure on sufficient additional land or find alternate uses for the manure.

This portion of the plan should include:

- determining the amount of land needed to adequately dispose of the manure (based on crop phosphorus needs)
- developing a nutrient budget for nitrogen, phosphorus, and potassium that includes all potential sources and losses of nutrients
- planned crop sequence
- realistic yield goals
- crop nutrient use
- current soil test results and manure and/or organic by-product test results
- form, source, amount, timing and method of application of nutrients

- potential build up of nutrient levels with time and application
- description of application equipment and method used for calibration

Note: Site specific technical requirements can be found in the NRCS Nutrient Management Standard (Code 590) ([Appendix D](#)).

4.4 Record of CNMP Implementation

If the landowner or operator is to properly apply and assess the effects of their [CNMP](#), it is critical that they maintain accurate records. Records that document the application of all elements of the CNMP should be kept. Records can be used to determine if the plan is meeting the intended objectives. They can also be used to aid in determining if changes are needed and the extent of the changes that may be needed.

Records should include:

- total quantity of manure/wastewater produced
- recommended and actual nutrient application rates
- total quantity of nutrients and organic by-products applied
- dates, fields, and acres on which nutrients were applied
- weather and soil conditions during nutrient application
- methods by which nutrients were applied
- crops planted, planting and harvesting dates, and crop yields
- results of soil and manure tests, and plant tissue tests if used
- dates and results of equipment calibration
- quantity sold or given away and agreements for proper off-site use of manure
- dates of plan review, including person performing the review and recommendations that resulted from the review
- dates and results of inspections and maintenance of manure handling equipment, storage facilities, and other facilities (e.g. barns, roof gutters, runoff control structures, etc.)
- emergency activities associated with discharge or overflow events

Notes: Record-keeping guidance and/or forms may be obtained from NRCS, Utah State University, Private Industry, Farm Organizations, Computer Software Distributors, or other organizations. **Where the CNMP is part of a [UPDES](#) permit, the producer is required to maintain appropriate documentation, including plan and implementation records, and to make them available to the Utah Department of Environmental Quality upon request.**

4.5 Feed and Animal Mortality Management

Feed management activities may be desired or necessary to reduce the nutrient content of the manure, making it easier to manage land application. Feed management is a planning consideration rather than a required technical standard.

Feed management activities may include; phase feeding, amino acid supplemented low crude protein diets, and the use of low phytin phosphorus grain and enzymes, such as phytase or other additives. Information and recommendations regarding feed management may be obtained from Utah State University, Industry, USDA-Agricultural Research Service, Private Industry, or other appropriate sources.

Dead animals should be handled in a manner that will not cause environmental problems. Generally accepted methods of handling dead animals include composting, rendering, disposal in the county landfill, or burial in a site and at a depth that will not create a water quality problem or a health risk. **Composting of dead animals requires the landowner or operator to obtain a permit from the Utah Division of Solid and Hazardous Waste (SHW). Further information can be obtained by contacting SHW at (801) 538-6170.**

4.6 Other Utilization Options

Use of manure and organic by-products in other environmentally safe ways besides land application should be given serious consideration as a part of a CNMP. This is especially true where past land application of manure and organic by-products have created high soil phosphorus levels and continued application will make those conditions worse. It may also be desirable where additional income sources are possible (e.g. high value products), or where it is necessary to transport the manure or other organic by-products long distances. Composting for example can reduce volume by 30 to 40% thus making it easier to haul and spread. It should be recognized that the use of options such as biogas generation might result in the loss of nitrogen but not other plant nutrients. It is the producer's responsibility, as the decision-maker; to select any other utilization options.

Possible alternatives include, but are not limited to:

- composting
- transport and safe use off-site
- use as a feed material for animals
- power generation (e.g., methane generation for fuel, combustion of litter, for energy, etc.)
- conversion to high-value products (e.g., fertilizer, home grower products, etc.)
- use as a soil conditioning material (e.g., on mine spoil or construction sites, on newly leveled fields where large cuts were made, etc.)

Note: All manure and organic by-product utilization options are to comply with Federal, State, Tribal, and local laws. Specific technical requirements will be based on NRCS Nutrient Management Standard (Code 590) and Waste Utilization Standard (Code 633) ([Appendix D](#)). **Where the CNMP is part of a [UPDES](#) permit and manure is sold or given away for use off site, the landowner or operator is responsible to provide the recipient with the nutrient content of the manure and general guidelines for proper application. They must also obtain a signature from the recipient agreeing that the manure will be applied according to the guidelines that are provided.**

APPENDIX A

THE NATURAL RESOURCES CONSERVATION SERVICE PLANNING PROCESS

NRCS uses a three-phase, nine-step planning process. The three phases and nine steps are:

Phase I - Collection and Analysis (Understanding the Problems and Opportunities)

1. Identify Problems
2. Determine Objectives
3. Inventory Resources
4. Analyze Resource Data

Phase II - Decision Support (Understanding the Solutions)

5. Formulate Alternatives
6. Evaluate Alternatives
7. Make Decisions

Phase III - Application and Evaluation (Understanding the Results)

8. Implement the Plan
9. Evaluate the Plan

The planning process is straight forward (See Figure 1) and cyclic in nature. All three phases and nine steps are important for successful conservation planning.

- The planning process may begin with any of the first three planning steps or step nine.
- There may be a need to cycle back to step three (inventory resources), while working on step four (analyze resource data), if more inventory information is needed. Inventory information can be gathered and recorded using the Utah CNMP Inventory Sheet (April 2000) ([Appendix G](#)).
- Step one (identify problems) and step two (determine objectives) are not complete until step four (analyze resource data) has been completed. The analysis in step four, at the very least, requires a brief review of problem identification and objective determination to make sure they are suitable. For the best planning results, an analysis of the effect of the selected alternative should be made. The analysis should consider the effects of the alternative on soil, water, plant and animal resources.

- There may also be a need for the landowner or operator to revise their objectives as alternatives are formulated and evaluated.
- Once the plan is developed, there may be a need to go back through the entire planning process and revise the plan. This may be necessary, as the plan is implemented or evaluated. Plan revisions may also be necessary because of changes in objectives, size of the unit, livestock numbers, economics, weather conditions, etc.
- Based on the results of implementation, there also may be a need to look at additional alternatives if the results of plan implementation are not solving the identified problems or meeting the landowner or operator's objectives.

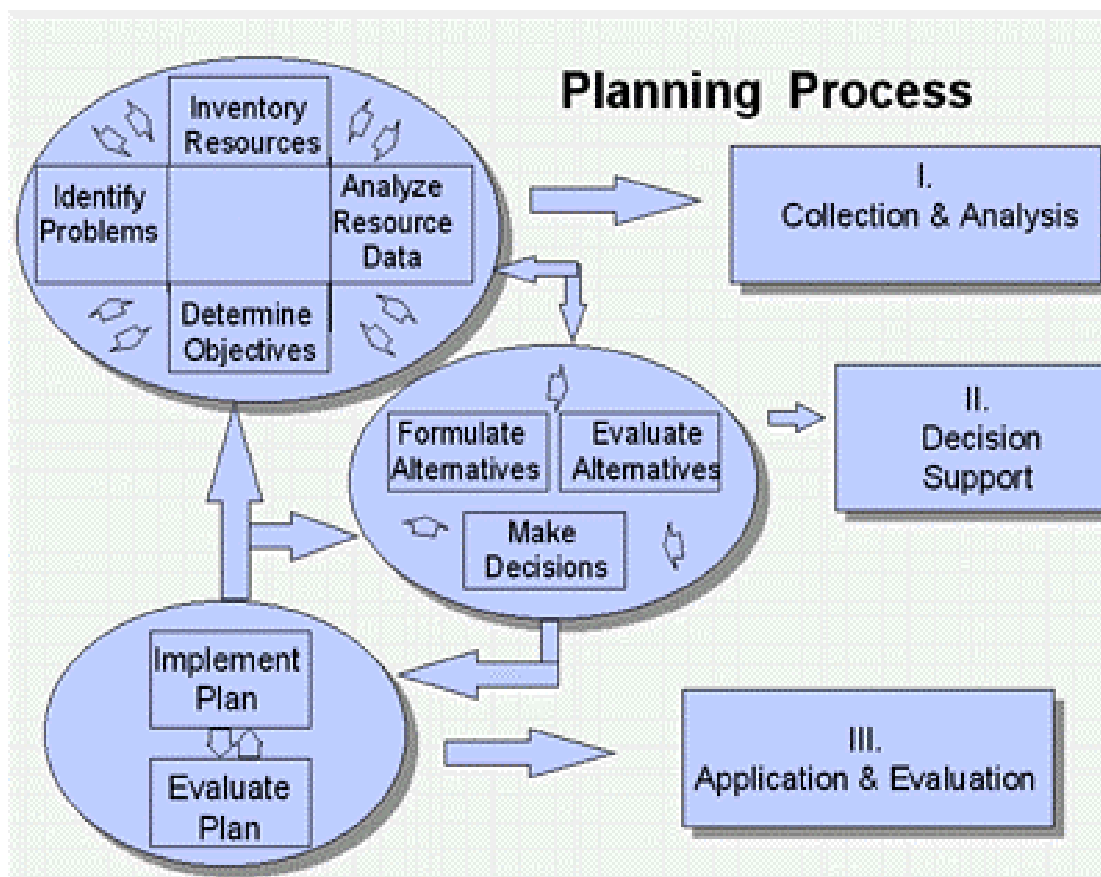


Figure 1.

APPENDIX B

NATIONAL AND STATE TECHNICAL REFERENCES, HANDBOOKS, AND POLICY DIRECTIVES

Technical References and Handbooks

The Natural Resource Conservation Service has numerous National and State technical references and handbooks that it uses to assist in the development of conservation plans and its various components. Listed below are those technical references and handbooks generally associated with the development of comprehensive nutrient management plans.

United States Department of Agriculture, Natural Resources Conservation Service (NRCS), National Engineering Handbook, Part 651, *"Agricultural Waste Management Field Handbook"* This handbook is available on the NRCS website at <http://www.ncg.nrcs.usda.gov/awmfh.html> and from the National Technical Information Service at the address shown at the end of this Appendix. Utah amendments to this handbook can be obtained from the local NRCS office or Utah State NRCS Office.

United States Department of Agriculture, Natural Resources Conservation Service, *"National Agronomy Manual"* This manual is presently under revision and is scheduled for release in spring of 2000. The draft version is available on the USDA server in Ft. Worth, Texas at <ftp://ftp.ftw.nrcs.usda.gov/pub/NAM/>.

United States Department of Agriculture, Natural Resources Conservation Service, *"National Planning Procedures Handbook (NPPH)"* This handbook is available from the NRCS, Conservation Operations Division, by contacting:

Director
Conservation Operations Division
Natural Resources Conservation Service
12th and Independence SW
Washington, D.C. 20013

United States Department of Agriculture, Natural Resources Conservation Service, *"Conservation Planning Course"* This course is available on the NRCS website at <http://www.ncg.nrcs.usda.gov/start.htm>.

United States Department of Agriculture, Natural Resources Conservation Service, *"Agronomy Technical Notes"* These notes are available on the NRCS website at <http://www.statlab.iastate.edu/survey/SQL/agronomy.shtml>

United States Department of Agriculture, Natural Resources Conservation Service, *"National Range and Pasture Handbook"* This handbook is available on the NRCS website at http://www.ncg.nrcs.usda.gov/tech_ref.html.

United States Department of Agriculture, Natural Resources Conservation Service, "*Soil Quality Information Sheets*" These sheets are available on the NRCS website at <http://www.statlab.iastate.edu/survey/SQI/sqiinfo.shtml>

Hard copies of available publications can be purchased from:

National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA. 22161

Telephone: 1-800-553-6847

United States Department of Agriculture, Natural Resources Conservation Service, "*Utah Irrigation Guide*". The Guide can be viewed at local Utah NRCS Offices.

United States Department of Agriculture, Natural Resources Conservation Service, "*Utah Technical Notes*". Copies of individual technical notes can be obtained at local Utah NRCS Offices.

United States Department of Agriculture, Natural Resources Conservation Service, "*Utah Manure Application Risk Index*". Copies of the index can be obtained at local Utah NRCS Offices or the Utah State NRCS Office. Email Kerry.Goodrich@ut.usda.gov.

United States Department of Agriculture, Natural Resources Conservation Service, "*Animal Manure Nutrient Balance Excel Spreadsheet*". Copies of the spreadsheet and manual can be obtained at local Utah NRCS Offices or the Utah State NRCS Office. Email Kerry.Goodrich@ut.usda.gov.

United States Department of Agriculture, Natural Resources Conservation Service, "*Utah Animal Waste Management Software*". Copies of the program and manual can be obtained from the Utah State NRCS Office. Email Kerry.Goodrich@ut.usda.gov

United States Department of Agriculture, Natural Resources Conservation Service, "*Utah Revised Universal Soil Loss Equation*". Copies of this handbook can be viewed at local Utah NRCS Offices.

Utah State University Extension Service, "*Utah Fertilizer Guide, Manure Best Management Practices: A Practical Guide for Dairies in Colorado, Utah and New Mexico*"; "*Cow Mortality Disposal*", and various other publications. These publications are available on the USU web site at <http://www.ext.usu.edu/publica/agpubs.htm>

Utah State University Extension Service, "*Utah Pasture Handbook*". This publication can be obtained from the local USU Extension office.

Policy Directives

NRCS policy is contained in Natural Resources Conservation Service, "*General Manual*". The index for the entire manual can be found at the following NRCS website <http://policy.nrcs.usda.gov/national/gm/index.htm>. Listed below are those policy directives, contained in the General Manual, generally associated with the development of comprehensive nutrient management plans.

Natural Resources Conservation Service, "*General Manual*", *Title 450, Technology, Part 401, Technical Guides*. This part of the General Manual is available at the NRCS website at <http://policy.nrcs.usda.gov/national/gm/title450/part401/index.htm>.

Natural Resources Conservation Service, "*General Manual*", *Title 190, Ecological Sciences, Part 402, Nutrient Management*. This part of the General Manual is available at the NRCS website at <http://www.nhq.nrcs.usda.gov/BCS/nutri/gm-190.html>.

APPENDIX C

COMPREHENSIVE NUTRIENT MANAGEMENT PLANS

Introduction

A [Comprehensive Nutrient Management Plan \(CNMP\)](#) is a document that is used to record landowner or operator decisions for natural resource protection, conservation, and enhancement. The landowner or operator is ultimately responsible for development and implementation of the CNMP. Assistance in developing all or portions of the plan may be obtained from NRCS, Utah State University Extension, private consultants, and farm cooperatives or organizations (e.g. Utah Farm Bureau, Utah Farmers Union, Utah Dairyman's Association, Utah Turkey Growers, etc.).

Decisions and resource information needed for implementation and maintenance of the plan are a part of the plan. The narrative and supporting documents should provide guidance for implementation and serve as a basis for compliance with state and federal regulations. It will also be a basis for program funding through federal, state, or local financial incentives if developed in accordance with NRCS standards.

A comprehensive nutrient management plan (CNMP) includes all land units, on which manure and organic by-products will be generated, handled, or applied on which the landowner owns or operates.

The following guidance serves as a guide for plan format and content. It is designed to help maintain quality and consistency in documentation of CNMP's developed in Utah. The list shows the suggested items that should be in the plan. The plan should be tailored to the meet the landowner or operators needs as well as to meet environmental objectives.

A CNMP checklist is included at the end of this appendix. The checklist can be photocopied and used to assure that all appropriate information is included in the CNMP.

Plan Format and Content

The plan document developed by or for the landowner or operator should be a quality document containing meaningful information. It should include the following items:

1. **A folder**, binder, or other means to assemble the contents of the plan.
2. **Facility** information including:
 - Name, address, and phone number(s)
 - Owner/operator of facility
 - Legal description (Township and Range)

- Hydrologic unit code
- Date the plan was prepared
- Name and signatures of planner and reviewer

3. Conservation plan map.

Aerial maps can be obtained from the local Farm Service Agency (FSA) or NRCS office or on the Internet at <http://terraserver.microsoft.com>. At a minimum, each map should include the following:

a. Title block showing:

- "Conservation Plan Map"
- "Prepared with assistance from (Name) "
- Name of the conservation district, county and state
- Scale of the map
- Date prepared
- North arrow

b. Body of map with:

- Boundary lines of the planning unit outlined
- Field boundaries
- Land use and acres for each land unit
- Identification of environmentally sensitive areas
- Appropriate map symbols and a map symbol legend on the map, or as an attachment

4. A soil map with appropriate interpretations, such as:

- available water holding capacity
- soil slope and depth
- depth to water
- permeability
- hydrologic unit group
- suitability for specific land uses

5. A record of the landowner or operator's decisions

The recorded decisions must reflect the desired objectives and necessary treatment needs as identified for the individual land units.

The appropriate land unit label, acres, official NRCS practice name, and brief description of the practice. A section that shows the month and year that each practice is scheduled to be applied, as well as to record when the practice is actually applied.

6. Appropriate worksheets. Include worksheets that are necessary to gather inventory information and to determine where potential problems may exist. The number and kind of worksheets needed would be determined by the individual situation. The planner may choose to use NRCS worksheets or develop their own as long as the appropriate calculations and information are included. Worksheets should include, but are not limited to:

- CNMP inventory worksheet
- nutrient budget worksheet
- Farm A Syst worksheets
- manure calculations
- storage calculations
- erosion estimates
- cost estimates
- Utah Manure Application Risk Index (UMARI)

7. Job or specification sheets, and other prepared material applicable to the specific planned practices (e.g. Nutrient Management, Grazing Management, Irrigation Water Management, Composting, Vegetative Buffers, etc.). These sheets should outline all items related to implementation of the specific practice including operation and maintenance.

8. Operation and Maintenance agreements. More detailed operation and maintenance agreements, depending on their size and complexity, may be contained in a separate document, but should be referenced in the CNMP in conjunction with the conservation system and practice(s) contained in the plan.

9. Engineering designs for items such as storage structures, composting facilities, and etc. should be included or referenced in the CNMP.

Comprehensive Nutrient Management Plan Review Checklist

The review checklist on the next two pages can be photocopied and used as a guide to assure that all necessary information is included in the CNMP. Some items may not be applicable or necessary in a given situation. For example, if all manure will be composted and hauled off-site, then land application information and UMARI worksheets would not be necessary. Individually developed materials may be used, rather than specific NRCS documents, as long as the same information is contained within the materials. For example, tables may be used to appropriately display information rather than narration. Items such as current and planned activities do not have to be displayed in the same place, but may appear in different places in the CNMP.

Comprehensive Nutrient Management Plan Review Checklist

Facility and Owner/operator Information

- ☐ Owner/operator of the facility
- ☐ Name, address, and phone number(s)
- ☐ Owner/operator goals and objectives
- ☐ Environmental goals and objectives
- ☐ Drawing of facility layout
- ☐ Legal description
- ☐ 8 digit hydrologic unit code
- ☐ Date CNMP was completed
- ☐ Name and signatures of planner(s), reviewer(s) and owner/operator

Conservation Plan Map and Soils Map

- ☐ Conservation plan map with appropriate map symbols
- ☐ Land features, fields, acres, and land use properly identified
- ☐ Soils information including soils features and limitations
- ☐ Sensitive/problem areas identified on plan and/or soils map

Record of Owner/operator Decisions and Schedule of Application

- ☐ Decisions recorded that reflect owner/operator and environmental objectives
- ☐ Schedule of application, including land unit label, acres, practice narrative and description, dates planned to be applied and dates applied

Facility Evaluations/Treatments or Practices

- ☐ Utah CNMP Inventory sheet (or equivalent)
- ☐ Farm A Syst worksheets (optional)
- ☐ Identification of sensitive/problem areas
- ☐ Clean water collection and/or diversion
- ☐ Runoff water collection and/or diversion
- ☐ Current/planned manure/wastewater production, collection, transfer, and treatment practices including provisions for odor control and silage leachate if needed
- ☐ Current/planned manure/wastewater storage structures for the appropriate storage period (Refer to AWMFH Utah Amendment 7)
- ☐ Operation and maintenance of facilities, handling equipment, and storage structures
- ☐ Current and required manure/wastewater testing practices
- ☐ Engineering notes, calculations, and designs

Land Evaluations/Treatments or Practices

- ☐ Utah CNMP Inventory sheet (or equivalent)
- ☐ Farm A Syst worksheets (optional)
- ☐ Identification of sensitive/problem areas
- ☐ Current/required soil testing
- ☐ Current/planned crop rotation and yields
- ☐ Current manure/wastewater application practices

Land Application of Manure and Wastewater

- ☐ Crop nutrient utilization values
- ☐ Determination of application rates
- ☐ Nutrient budget information for rotation
- ☐ Basis for application rates on individual fields (N or P)
- ☐ Number of acres needed for proper application of manure/wastewater
- ☐ Planned form, source, amount, timing, and method of application
- ☐ Identification of soil phosphorus threshold levels and situations where there is a potential for buildup of nutrients

Land Management Practices – Job Sheets, Specification Sheets, or Other Methods of Identification of Practice Requirements (Based on UMARI and/or other inventory analysis)

- ☐ Irrigation water management plan (required)
- ☐ Installation of vegetative barriers
- ☐ Irrigation system improvement
- ☐ Cover/residue management
- ☐ Soil moisture management
- ☐ Appropriate setbacks
- ☐ Grazing management
- ☐ Runoff containment
- ☐ Tailwater recovery
- ☐ Erosion control
- ☐ Other _____

Feed and Animal Mortality Evaluations/Treatments

- ☐ Current/planned feed management programs (optional)
- ☐ Current/planned feed storage facility management (optional)
- ☐ Current/planned animal mortality management
- ☐ Requirements for disposal of animal medical wastes (UPDES)

Record Keeping

- ☐ Outline of records that are to be kept (refer to Nutrient Management standard and UPDES requirements for record keeping)
- ☐ Description or photocopy of record keeping system that will be used
- ☐ Requirements for periodic plan review and inspection of facilities, manure handling equipment, and storage structures

Other Utilization Options (if used)

- ☐ Composting site plan and operation and maintenance plan
- ☐ Plan for use of composted manure (e.g. land application, animal feed, bedding, soil conditioning, or marketed as high value product)
- ☐ Biogas generation plan with operation and maintenance plan
- ☐ Type and amount of manure to be transported off-site
- ☐ Agreements or arrangements for off-site use of manure/wastewater

APPENDIX D

CONSERVATION PRACTICE STANDARDS

Natural Resources Conservation Service (NRCS) conservation practice standards provide guidance for applying technology on the land, and set the minimum level for acceptable application of the technology.

NRCS issues and regularly reviews national conservation practice standards in its National Handbook of Conservation Practices (NHCP). National standards for each practice are available at the NRCS website http://www.nrcg.nrcs.usda.gov/nhcp_2.html. State Conservationists determine which national standards will be used in their state.

State Conservationists may choose to use the national standards as written or to adapt them for use in their state and issue them as state conservation practice standards. State Conservationists add the technical detail needed to effectively use the standards at the field office level. State issued practice standards are contained in Section IV of the Field Office Technical Guide.

Copies of Utah NRCS state issued conservation practice standards are not currently available on the Utah NRCS Homepage, but will be available later at <http://www.ut.nrcs.usda.gov/technicalinfo.htm>. Copies can currently be obtained by contacting the appropriate NRCS State or local office ([Appendix F](#)). Following is a listing of most of the conservation practice standards that might be used in Utah when developing a CNMP:

Practice Code	Practice Name	Date of Most Recent Revision	State or National Issued Standard
360	Closure of Waste Impoundment's	2/00	National
317	Composting Facility	10/00	State
328	Conservation Crop Rotation	3/93	State
360	Covered Anaerobic Lagoon	5/96	National
356	Dike	7/91	State
362	Diversion	2/91	State
382	Fence	11/82	State
393	Filter Strip	3/99	National
412	Grassed Waterway	10/85	National
388	Irrigation Field Ditch	10/77	National
464	Irrigation Land Leveling	5/89	State
442	Irrigation System, Sprinkler	7/91	State
443	Irrigation System, Surface	5/89	State
447	Irrigation System, Tailwater Recovery	4/81	State
449	Irrigation Water Management	7/99	State

Practice Code	Practice Name	Date of Most Recent Revision	State or National Issued Standard
634	Manure Transfer	7/97	National
590	Nutrient Management	10/00	State
512	Pasture and Hayland Planting	9/93	State
516	Pipeline	7/91	State
430DD	Pipeline, High Pressure, Underground	2/95	State
430EE	Pipeline, Low Pressure, Underground	7/91	State
430HH	Pipeline, Rigid Gated Pipe	10/85	National
378	Pond	5/89	State
521C	Pond Sealing or Lining – Bentonite Sealant	10/77	National
521A	Pond Sealing or Lining – Flexible Membrane	10/77	National
521B	Pond Sealing or Lining – Soil dispersant	10/77	National
528A	Prescribed Grazing	6/94	National
533	Pumping Plant for Water Control	7/91	State
329B	Residue Management – Mulch Till	3/99	National
329A	Residue Management – No-till and strip till	3/99	National
344	Residue Management, Seasonal	6/94	National
391A	Riparian Forest Buffer	5/96	National
558	Roof Runoff Management	6/84	National
570	Runoff Management System	10/78	National
350	Sediment Basin	10/78	National
574	Spring Development	7/91	State
584	Stream Channel Stabilization	10/77	National
580	Streambank Protection	7/91	State
587	Structure for Water Control	5/89	State
612	Tree/Shrub Establishment	7/93	State
614	Trough or Tank	10/87	National
620	Underground Outlet	12/90	National
472	Use Exclusion	6/94	National
312	Waste Management System	4/99	National
313A	Waste Storage Facility-Manure Staging Area	10/00	State
313	Waste Storage Facility-Pond	10/95	State
313	Waste Storage Facility-Structure	9/95	State
359	Waste Treatment Lagoon	9/94	State
633	Waste Utilization	In revision	State
638	Water & Sediment Control Basin	2/91	State
380	Windbreak/Shelterbreak Establishment	7/96	State

APPENDIX E

FIELD OFFICE TECHNICAL GUIDE

The Natural Resources Conservation Service (NRCS) Field Office Technical Guide (FOTG) is an essential tool for resource planning. The FOTG contains five sections:

I- General Resource References – This section contains references to manuals, books, technical notes, etc.; maps, cost lists, typical crop budgets, and other information for use in understanding the field office working area, or in making decisions about resource use and resource management.

II- Soil and Site Information – Soils are described and interpreted to help make decisions about land use and management. In many cases, this will be an electronic database.

III- Resource Management Systems – This section contains guidance for developing conservation management systems. A description of the resource considerations (soil, water, air, plants, and animals) and their acceptable levels of quality or criteria are included in this section.

IV- Practice Standards and Specifications – This section contains standards and specifications for conservation practices used in the field office. Conservation practice standards contain minimum quality criteria for designing and planning each practice; specifications describe the requirements necessary to install a practice.

V- Conservation Effects – This section contains Conservation Practice Physical Effects matrices that outline the impact of practices on various aspects of the five major resources – soil, water, air, plants, and animals.

The FOTG is a document that is updated regularly to reflect changes in technology, resource information, and agency policy. It contains information that is unique to Utah and to the local field offices. To obtain information contained within the FOTG, contact the United States Department of Agriculture, NRCS, State Office or office nearest you ([Appendix F](#)).

APPENDIX F

UTAH NRCS OFFICES

STATE OFFICE

125 South State Street
Salt Lake City UT 84138
PO Box 11350
Salt Lake City UT 84147
(801) 524-4550
(801) 524-4403 fax

Murray UT 84123
(801) 263-3204
(801) 263-3667 fax

Ogden Field Office
2871 South Commerce Way
Ogden UT 84401
(801) 629-0580
(801) 629-0574 fax

AREA I

Bonneville Area Office

302 East 1860 South
Provo UT 84606-7317
(801) 377-5880
(801) 356-1237 fax

Provo Field Office
302 East 1860 South
Provo UT 84606-7317
(801) 377-5880
(801) 356-1237 fax

Coalville Field Office

Dearden Building
30 Main Street
Coalville UT 84017
(435) 336-5853
(435) 336-2132 fax

Randolph Field Office
195 North Main
PO Box 97
Randolph UT 84064
(435) 793-3905
(435) 793-2745 fax

Heber Field Office

2210 South US Highway 40 Suite B
Heber City UT 84032
(435) 654-0242
(435) 654-0371 fax

Tooele Field Office
185 North Main Street
Tooele UT 84074
(435) 882-2276
(435) 882-0429 fax

Ibapah Satellite Office

Tribal Office Building
PO Box 6035
Ibapah UT 84034
(435) 234-1182
(435) 234-1162 fax

Tremonton Field Office
85 South First East
Tremonton UT 84337
(435) 257-5403
(435) 257-1930 fax

Logan Field Office

1860 North 100 East
North Logan UT 84341-1784
(435) 753-5616
(435) 755-2117 fax

Murray Field Office

1030 West 5370 South, Suite 100

Richfield Area Office
340 North 600 East
Richfield UT 84701
(435) 896-6441
(435) 896-9339 fax

AREA II

Beaver Field Office

620 North Main
PO Box 640
Beaver UT 84713-0640
(435) 438-5092
(435) 438-2168 fax

Cedar City Field Office

Blackrock Village
2390 West Highway 56 #14
Cedar City UT 84720
(435) 586-2429
(435) 586-0649 fax

Fillmore Field Office

65 West 100 North
PO Box 506
Fillmore UT 84631
(435) 743-6655
(435) 743-5117 fax

Loa Field Office

150 South Main Street
PO Box 388
Loa UT 84747
(435) 836-2652

Manti Field Office

50 South Main Suite #3
Manti UT 84642
(435) 835-4171
(435) 835-4113 fax

Nephi Field Office

740 South Main
Nephi UT 84648
(435) 623-0342
(435) 623-2368 fax

Panguitch Field Office

Riley & Carter Office Building
225 East Center Street
PO Box 362
Panguitch UT 84759-0362
(435) 676-8021
(435) 676-8432 fax

St. George Field Office

196 East Tabernacle Street
PO Box 760
St. George UT 84771-0760

(435) 673-4896
(435) 673-0312 fax

AREA III

Vernal Area Office

80 North 500 West
Vernal UT 84078
(435) 789-2100
(435) 789-4160 fax

Castle Dale Field Office

90 South 1st East
Castle Dale UT 84513
(435) 381-5554
(435) 381-5696 fax

Ft. Duchesne Service Center

Ute Tribe Water Settlement Bldg.
PO Box 745
Ft. Duchesne UT 84026
(435) 722-8435
(435) 722-5195 fax

Monticello Field Office

32 South 1st East
PO Box 639
Monticello UT 84535
(435) 587-2481
(435) 587-2104 fax

Price Field Office

350 North 400 East
Price UT 84501
(435) 637-0041
(435) 637-3146 fax

Roosevelt Field Office

Nile Chapman Building
240 West Highway 40, 333-4
Roosevelt UT 84066
(435) 722-4621
(435) 722-9065 fax

APPENDIX G

COMPREHENSIVE NUTRIENT MANAGEMENT PLAN INVENTORY SHEET

Development of a Comprehensive Nutrient Management Plan (CNMP) requires an inventory of individual farm information related to:

- manure production, collection, storage, treatment, and transfer of manure
- land management practices that influence nutrient runoff and leaching
- land application of manure along with soil and manure testing
- feed management and management of dead animals

This information is necessary in order to determine manure nutrient content, as well as to identify practices that may be needed to solve potential pollution problems. The following sheets provide a format for farmers and ranchers to gather and record inventory information on their farms. This information is necessary in order to develop a CNMP. If it is not clear what information is needed or how to gather the information, help is available from the Natural Resources Conservation Service (NRCS), County Extension Agent, Soil Conservation District, producer association, or a private consultant.

The **plot drawing** should show the general outline of the feedlot or facility where the animals are confined. It should also show buildings such as feed storage areas and housing areas, storage structures, and ditches or other waterways that run through or are adjacent to the facility. If necessary an additional sheet should be used. Lot size in square feet is calculated by multiplying the length of the lot in feet by the width of the lot in feet. Where more than one feedlot or facility exists on the individual farm or ranch, information should be provided for each one.

Soil and manure testing are two very important components of the inventory gathering process. Contact the County Extension Agent or NRCS for help in taking soil and manure tests. Initially, soil tests should be taken on every field. The soil test should be taken for soil phosphorus levels only, unless manure will be applied to an annual crop. When manure is to be applied to an annual crop, the soil test should include a test for soil nitrogen level as well as phosphorus. Manure tests should be taken separately for different manure types. This information should be attached to the inventory worksheets.

Feed management is an optional component of a CNMP. If feed management practices are not or will not be used, this information can be left blank. The information supplied should be in regards to the type and amount of feed or special supplements such as phytase that are designed to reduce the nutrient content of the feed or in the manure.

The information provided should be as specific and accurate as possible. The numbers provided have a large impact on the design of storage and handling systems and on the potential for nutrient runoff and leaching. If additional room is needed, record the information on a blank sheet and attach it to the inventory sheets. The information should reflect any plans to increase the number or type of animals, to purchase additional land, or to make other changes in the way manure is handled or stored, or in land management practices.

Additional information such as Farm A Syst worksheets, Best Management Practices for Dairies, or other brochures can be obtained through the County Extension Agent, NRCS or over the Internet. These informational materials can be used to identify potential pollution problems as well as provide possible solutions to identified problems.

Bedding *(Loads, Tons, or Bales)				Barn Wash/Flush Water (Gallons)		
Type of Bedding	*Amount Used	How Often (D/W/or M)	Total Tons Used (Yr)	Amount of Water	How Often (D/M/orYr)	Total Used (Yr)

D=daily, W=weekly, M=monthly, Yr=yearly

Housing (Describe the type of housing such as open lot, free stall, stanchion; and number and type of animals housed):

Roof and/or Lot Runoff (Describe how runoff is collected and/or diverted and if so how):

Dead Animal Management (Describe how dead animals are disposed of):

Describe how solid & liquid manure is collected, transferred, treated, & stored (Include how often, method used, storage sizes, equipment used, manure test values, etc.) (Attach manure test information)

Solid:

Liquid:

Description of how solid and liquid manure is utilized (Include time manure is applied, amount applied, crop(s) and acres applied to, how and when incorporated, equipment used, etc., or other ways manure is utilized such as for composting, bedding, or feed):

Solid:

Liquid:

Manure Application Equipment					
Type of Spreader	Dimensions (l-w-h)(dia)	Capacity (ft³,bu,gal)	Number and Kind of Spreader Setting(s)	Spread Width (ft)	Spread Distance (ft)

l=length, w=width, h=average height when full of manure, ft³=cubic feet, bu=bushels, gal=gallons, type of spreader=box, slurry, tank, etc., kind of spreader settings=PTO, apron, etc.

Irrigation Water Management						
Field # or Name	Method of Irrigation	Stream Size (cfs or gpm)	Field Length (ft)	Width of Sets (ft)	Hours/Set	# of Irrigations/year

Method of Irrigation=wheeline, border, furrow, etc., cfs=cubic feet per second, gpm=gallons per minute

Irrigation Water Delivery (Include if source is from a stream or well, if it is delivered on demand or on turns or some other way, variability of stream size, etc.):

Grazing Management								
*Field # or Name	Acres	Yield	Grass/Crop Grown	Animal Type	# of Animals	Average Weight	Days on Field	Month(s) on Field

* Include only those fields where manure is or will be applied in addition to grazing

Feed Management (Describe any measures that are or will be used to alter manure nutrient content through feed management such as phytase feeding, milk urea nitrogen testing, etc.)

Conservation Practices You Believe Are Needed (List and describe the practices such as changes needed in collection, storage, treatment, transfer, or utilization, changes in land management practices, animal numbers or type, feed management, etc.):